joint and axillary radiographs can confirm joint narrowing, osteophytes, or distal clavicular resorption, as seen in osteolysis or weight lifter's shoulder.

Glenohumeral osteoarthritis often presents with a slow, progressive onset of pain over an extended period of time, with less intense night pain than with rotator cuff disorders, but possibly a more substantial loss of motion, especially external rotation and overhead elevation. On examination, it is not uncommon to observe other joint involvement such as Heberden's nodes or hip and knee symptoms. Active range of motion displays audible or palpable crepitus, which is the unmistakable sound of "bone on bone." Rotational AP views, scapular lateral, and axillary radiographs typically reveal a loss of joint space, marginal osteophytes, and subchondral sclerosis. Unless there is some question regarding the quantity and quality of glenoid bone stock, rotator cuff integrity, or infection, it is rare to require further imaging to devise a treatment plan.

Acute trauma to the shoulder resulting in fracture presents with the typical scenario of pain, swelling, ecchymosis, and possibly deformity. It does not pose a major diagnostic dilemma, but it is of utmost importance not to overlook associated osseous, soft tissue, and neurovascular injuries. In this situation, accurate fracture classification is entirely dependent on adequate plain radiographs. The most widely accepted classification of proximal humeral fractures is based on displacement of the anatomic and surgical neck and greater and lesser tuberosity fragments.[4] To treat these injuries, all four fragments must be identified radiographically. Most of these injuries can be diagnosed with plain radiographs consisting of at least a trauma series. Additional oblique radiographs can be helpful, but the addition of computed tomographic (CT) scanning to further delineate fracture fragments has not been found to appreciably change the diagnosis made on plain films. About 80% to 85% of proximal humerus fractures are minimally displaced and can be treated without surgery. Some two-part fractures are amenable to closed reduction, but the more unstable and comminuted injuries will require techniques ranging from open reduction and internal fixation to proximal humerus replacement.[5]

In conclusion, most shoulder disorders, be they chronic pain, instability, arthritis, or the result of acute trauma, can be diagnosed by a thorough history, physical examination, and plain radiographs without further advanced imaging techniques. Clearly, MRI, ultrasonography, CT arthrography, and other investigative aids have an important role in more clearly delineating the disorder in routine and not so routine cases, and their use should not be abandoned. Their judicious use is probably more beneficial to the system as a whole, including the patient. The fine art of the history and physical is still worth its weight in gold.

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Cure, Conservation, Confusion, Chaos

Her agony came from the fact that mastectomy would be curative, and it was hard to turn that down. A lesser procedure, while preserving her breast and her femininity, offered her somewhat less chance for a complete cure—but exactly how much less was unknown. Perhaps only a small amount less. It didn't seem worth losing her breast for a few percentage points.

Yet, maybe it was. It was the most difficult decision of her life. But medicine had failed her. The data upon which to base her judgment was weak, and we had shifted the burden of that judgment to her.[1]

THE ABOVE PARAGRAPH was written in 1991 about a woman with ductal carcinoma in situ (DCIS) of the breast and her difficult journey through the medical system as she searched for the "right" treatment. There were a number of "right" treatments then for her particular form of carcinoma, but each was flawed in some way, confounding her thoughts, making her decision more difficult. But that was 1991; it is now 1995, and we know more about DCIS. But is the decision-making process any easier?

During my five-year surgical residency in Boston in the 1960s, I never saw a case of DCIS, and I have no recollection of ever hearing of it during my training. If a patient with this type of cancer had presented at that time, she would have been treated with a mastectomy just like any other patient with breast cancer. During the 1960s, to most physicians, breast cancer was breast cancer. It was all the same, unless you were a specialist in diseases of the breast—and there were few of those.

The most prominent textbook of the time devoted solely to breast disease was written by Haagensen.[2] He defined intraductal breast cancer as a lesion that appeared to grow predominantly within the mammary ducts. That meant that a substantial proportion of the lesion, as much as 49%, could be invasive. Haagensen treated the lesion, like any other invasive cancer, with radical mastectomy. He reported that the average lesion measured 47 mm and that 62% of his patients with intraductal carcinoma had metastases to axillary lymph nodes.[2]

During the past 30 years, there have been tremendous changes in the diagnosis, treatment, and our understanding of breast cancer biology. Ductal carcinoma in situ is now defined as being wholly intraductal without any invasion. Instead of a clinical rarity presenting as a mass or nipple discharge, DCIS is now common, generally non-

TABLE 1.—*Van Nuys Prognostic Index (VNPI) Scoring System**

Score	Points 1	2	3
Size, mm	≤15	16-40	≥41
Margins, mm	≥10	1-9	<1
Pathologic classification	Non-high grade, without necrosis	Non-high grade, with necrosis	High grade, with or without necrosis

*Scoring: 1-3 points are awarded for each of the 3 different predictors of local breast recurrence. Scores of each predictor are totaled to yield a VNPI score ranging from 3-9.

palpable, and usually presents as a mammographic abnormality. Instead of one simple treatment, there are now several alternatives accompanied by a great deal of confusion. Instead of physicians deciding what to do and when to do it, as they did 30 years ago, patients now play a key role in the decision-making process.

So how is DCIS treated? Thirty years ago, the answer was simple. Today, it is much more complicated, requiring a thorough integration of the mammographic and pathologic findings. We now appreciate that DCIS is a heterogeneous group of lesions rather than a single disease; no single treatment is going to be appropriate for all lesions.

The long-awaited results of the National Surgical Adjuvant Breast and Bowel Project (NSABP) protocol B17 were published in 1993.[3] This prospective, randomized study was supposed to solve, once and for all, the complex treatment controversy. More than 800 patients with DCIS excised with clear surgical margins were randomly assigned to two groups: excision only and excision plus radiation therapy. At five years, there was a statistically significant decrease in local recurrence of both DCIS and invasive breast cancer in patients treated with radiation therapy. These data led the NSABP to recommend post-excision radiation therapy for all patients with intraductal carcinoma who chose to save their breasts, a recommendation that may be too broad. The study was criticized for a number of reasons,[4,5] the most important being a lack of pathologic subset analysis.

Consider the following two patients, both of whom merit radiation therapy according to NSABP recommendations. Patient 1 is a woman with a 5-mm low-grade micropapillary DCIS widely excised with a minimum of 10-mm margins in all directions. Compare her with patient 2, a woman with a 20-mm high-grade comedo lesion with DCIS approaching to within 0.1 mm of the inked margin but not involving it. According to the NSABP, both of these patients should be treated with radiation therapy. At our facility, the first patient would receive no additional therapy. She would be carefully observed with physical examination and mammography every six months. The second patient would undergo a wide reexcision before a final treatment decision was made. Substantial residual disease approaching the new margins would earn a recommendation for mastectomy and immediate reconstruction; widely clear new margins with little or no residual cancer would earn a recommendation for radiation therapy.

The point is that the decision-making process regarding the treatment of DCIS is not much clearer now than it was in 1991. The article on DCIS by Barth and associates elsewhere in this issue of the journal presents a concise overview of the state of the art.[6] The references are excellent, as are the authors' interpretation of the current data. But if physicians want the definitive answer or a recommendation about how to treat a specific patient with DCIS, it will not be found in this overview. The authors offer no personal opinions. For physicians who do not know much about DCIS or who want to refresh what they already know, this overview is a perfect start. But if after reading it they want to know more, they are going to have to do more work.

I would like to share briefly the direction that our group has taken in its DCIS research. Although we have great respect for the NSABP and what they have accomplished, we have difficulty accepting the blanket recommendation for radiation therapy for all patients with DCIS who elect breast conservation.

There are numerous clinical, pathologic, and laboratory factors that might aid clinicians and patients wrestling with the difficult decisions regarding treatment. Our research has shown that nuclear grade, the presence of comedo-type necrosis, tumor size, and margin status are all important factors in predicting local recurrence in patients with DCIS.[7,8] By using a combination of these factors, it may be possible to select subgroups of patients who do not require irradiation, if breast conservation is elected, or to select patients whose recurrence rate is potentially so high, even with breast irradiation, that mastectomy is preferable.

We used the first two of these prognostic factors (nuclear grade and necrosis) to develop a new DCIS pathologic classification.[9] But nuclear grade and comedo-type necrosis are inadequate as the sole guidelines in the treatment selection process. Tumor size and margin status are also important. By combining all of these factors, we have developed the Van Nuys Prognostic Index (VNPI) (M.J.S., D. N. Poller, P. H. Craig, et al, "A Prognostic Index for Breast Ductal Carcinoma In Situ," unpublished data, 1995).[10] Table 1 shows the VNPI scoring system. Scores from 1 to 3 are awarded for each of the three different predictors of local breast recurrence—size, margins, and pathologic classification. The scores for each predictor are totaled to yield a VNPI score ranging from a low of 3 to a high of 9. Patients with a low VNPI score (3 or 4) show no difference in disease-free survival at eight years regardless of whether or not they received radiation therapy and can be treated with excision only. Patients with intermediate scores (5, 6, or 7) show a statistically significant decrease in local recurrence rates with radiation therapy. Conservatively treated patients with VNPI scores of 8 or 9 have unacceptably high local recurrence rates, regardless of irradiation, and should be considered for mastectomy.

We first introduced the idea of a prognostic index for DCIS at the 1995 Annual Meeting of the Society of Clinical Oncology. Since that time, we have analyzed an outside group of patients with DCIS, confirming the validity of the VNPI. We plan to present this combined analysis of 540 patients with DCIS at the 18th Annual San Antonio (Texas) Breast Symposium in December 1995.

The VNPI is the first attempt to quantify known important prognostic factors in DCIS, making them clinically useful in the treatment decision-making process. In the future, other factors, such as molecular markers, may be integrated into the VNPI when they are shown to statistically influence the likelihood of local recurrence after breast conservation therapy.

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